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10/016,423

10/26/2001

Nobuhito Matsushiro

9976-11US (OB0027US)

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08/27/2004

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ONE COMMERCE SQUARE  
2005 MARKET STREET, SUITE 2200  
PHILADELPHIA, PA 19103-7013

EXAMINER

ROSARIO-VASQUEZ, DENNIS

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 08/27/2004

3

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/016,423

Applicant(s)

MATSUSHIRO ET AL.

Examiner

Dennis Rosario-Vasquez

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 5-7 is/are rejected.
- 7) ☒ Claim(s) 1-9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Drawings*

2. Claims 1-9 is/are objected under 37 CFR 1.84 (o) for not having "suitable descriptive legends" which are "required by the examiner where necessary for understanding of the drawing." Drawings 2-6 require descriptive legends for each set of boxes for each figure.

### *Specification*

3. The disclosure is objected to because of the following informalities:  
Page 14, line 15: "inequality" ought to be amended to "inequality"

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1,2,5,6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tan et al. (US Patent 6,600,833 B1) in view of Cass (US Patent 6,023,525 A).

Regarding claims 1 and 5, Tan et al. discloses a method and apparatus for deriving spectral sensitivity characteristics of a color image input device, comprising:

a) a metamer data processing section (fig. 130, num. 130) to set a constraint (Equation 12 in col. 5, line 19 is referred to as a "constraint" in col. 5, lines 13-20.) that tristimulus values ("u" of equation 12 of col. 5, line 19 corresponds with "CIE XYZ tristimulus" target colors as mentioned in col. 5, lines 21,22.) of metamer data ("v" of equation 12 is a device's characteristic as mentioned in col. 5, line 23.) perceived to be the same in color by observation in a color matching evaluation experiment ("EXPERIMENTS" in fig. 1, num. 130 uses the constraint of equation 12.) are made equal ("reproduced" color in col. 3, line 60 and col. 5, line 22), to said metamer data, ("v" of equation 12.)

The tristimulus values (u of equation 12 ) is made equal to a device's characteristic "v" via a color correction matrix M to "reproduce" the color "u" of equation 12 as mentioned in col. 5, lines 15-23. Note that a device's characteristic "v" corresponds to a "known [or measured] color response" of the device as mentioned in col.1, lines 18-20.

Additionally equation 3 in col. 1, line 56 is another form of equation 12 that uses the same method of equation 12 as discussed in col. 1, lines 5-67;

b) an objective function setting section (fig. 1, num. 140) to obtain a third objective function (Fig. 1, num. 140 computes a modified cost function "J" as mentioned in col. 5, lines 25-28.) by assigning weights ("WEIGHTING FACTOR" in fig. 1, num. 130) to a first objective function (Fig. 1, num. 130, "BRIGHTNESS" or (" $\epsilon_C$ ").) including a standard color matching function (" $\epsilon_C$ " includes a function "Q" that "corresponds" with a "standard color space" of CIE XYZ values in equation 4a as mentioned in col. 1, lines 23,24 and col. 3, lines 1-10) and to a second objective function (Fig.1, num. 130:"NOISE" or (" $\epsilon_N$ ") in a uniform color space ("NOISE" is measured using color patches.) and by binding these two objective functions together (Equation 7 of col. 4, lines 8,9 sums the objective functions " $\epsilon_N$  and " $\epsilon_C$ " together.);

c) an amended color matching calculating and processing section (fig. 1, num. 160 and 170) to obtain, by using the method of Lagrange multipliers ("LaGrange multiplier" or " $\lambda$ " as mentioned in col. 5, line 29 and computed within fig. 1, num. 130.), a correcting color matching function (Equation 13 in col. 5, line 28. Note that " $\lambda$ " is used in equation 13.) used for correction (Equation 13 also has a correction matrix "M" as mentioned in col. 5, lines 24-28.) to make said third objective function (Fig. 1, num. 140 is a modified function "J" as mentioned in col. 5, lines 25-28.) minimum (The output of fig. 1, num. 140 is a minimized function "J" that uses the LaGrange multiplier as mentioned in col. 5, lines 29-35.) under said constraint (Equation 12 in col. 5, line 19 is referred to as a "constraint" in col. 5, lines 13-20.). Note that the constraint is used in the step of the correcting color matching function of equation 13.);

d) a step of obtaining an amended color matching function (Fig. 1, num. 170.) to be amended ("NO" branch of num. 170 loops back to calculate new weights in num. 130.) based on a sum (Equation 13 is an addition equation of multiple terms which includes the standard color matching function "Q" as one of the terms. )of said obtained correcting color matching function (Equation 13 in col. 5, line 28 ) and said standard color matching function ("Q" of figure 4a in col. 3, lines 1-10); and

e) a step of obtaining spectral sensitivity characteristics ("OUTPUT COLOR CORRECTION MATRIX M" of fig. 1, num. 180.) amended (by the "NO" branch of fig. 1, num. 170) by using said amended color matching function (Fig. 1, num. 170: "YES" branch is directed to the "OUTPUT COLOR CORRECTION MATRIX M").

Tan et al. does not teach the constraint with the limitation of tristimulus values perceived to be the same in color. However, Tan et al. does suggest, "adding a constraint" that selects a color as mentioned in col. 5, lines 15-18.

However, Cass in the field of endeavor of color space processing teach the limitation of a constraint ("criterion" in col. 3, lines 14-17) that tristimulus values ("input color c" in col. 3, lines 14-17) perceived to be the same in color ("minimally perceptible to a human viewer" in col. 3, lines 14-17).

Cass states, "Another criterion for selecting the changed color is that the color difference between input color c and the changed color is a color difference...minimally perceptible to a human viewer...(col. 3, lines 14-17)."

It would have been obvious at the time the invention was made to one of ordinary skill in the art to modify Tan et al.'s teaching of adding a constraint also referred to as

"RULES" in fig. 1, num. 130 by adding Cass's teaching of a constraint in fig. 5, num. 440 because Cass's constraint determines an optimal color as mentioned in col. 3, lines 30-36.

Regarding claim 2, Tan et al. teaches the method for deriving the spectral sensitivity characteristics according to claim 1, wherein said tristimulus values are CIE (Commission Internationale de L'eclaire) XYZ values ("u" corresponds with "CIE XYZ tristimulus" as mentioned in col. 5, lines 21,22.) and wherein said first objective function (Fig. 1, num. 130, "BRIGHTNESS" or (" $\epsilon_C$ ").) is a standard color matching function in a CIE XYZ colormetric system (" $\epsilon_C$ " includes a function "Q" that "corresponds" with a "standard color space" of CIE XYZ values in equation 4a as mentioned in col. 1, lines 23,24 and col. 3, lines 1-10) and said second objective function (Fig.1, num. 130:"NOISE" or (" $\epsilon_N$ ") is an objective function in CIE LAB color space (CIE XYZ color space or CIE LAB color space can be used to compute the NOISE by finding a relation between a color space of a device and a standard color space the CIE XYZ or CIE LAB spaces for computing NOISE as mentioned in col. 1, lines 20-25 and col. 2, line 25.).

Regarding claim 6, Tan et al. teaches the spectral sensitivity characteristic deriving apparatus according to claim 5, wherein said metamer data processing section (fig. 1, num. 130) sets said constraint (Equation 12 in col. 5, line 19 is referred to as a "constraint" in col. 5, lines 13-20.) that CIE XYZ values ("u" of equation 12 of col. 5, line 19 corresponds with "CIE XYZ tristimulus" target colors as mentioned in col. 5, lines 21,22.) of metamer data ("v" of equation 12 is a device's characteristic as mentioned in

col. 5, line 23.) made equal ("reproduced" color in col. 3, line 60 and col. 5, line 22), to said metamer data ("v" of equation 12).

Claim 7 has been addressed in claim 2.

***Allowable Subject Matter***

6. Claim 3,4,8,9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 3 and 8 are allowable because the prior art does not teach or suggest metamer data that includes an experiment with spectral reflectance factors of two colors perceived to be the same color of a reference spectral reflectance factor.

Claims 4 and 9 are allowable because the prior art does not teach or suggest excluding inexact metamer data.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tsukada (US Patent 6,560,358 B1) is pertinent as teaching a method of calculating spectral reflectance for two surfaces(fig. 2, num. 11 and 12).

Yoon et al. (US Patent 6,337,923 B1) is pertinent as teaching a method of a minimizing metamerism in fig. 3.



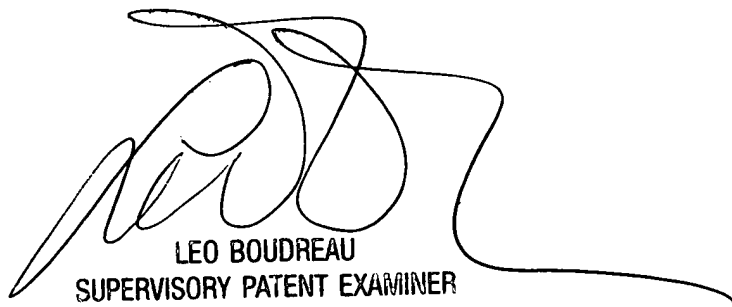
Park et al. (US Patent 5,791,781 A) is pertinent as teaching a method of one matching reference (Aref of fig. 7) and one metamerich patch (Ameta of fig. 7).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario-Vasquez whose telephone number is 703-305-5431. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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